

CLAIMS

What is claimed is:

1. A sprocket support member (31, 32, 33) for a bicycle sprocket (15, 16, 17, 18, 19, 20) assembly (10) comprising at least one engagement portion (34) provided with means (35) for coupling with a bicycle freewheel and at least one fastening portion (37) arranged in a radially external position with respect to the engagement portion (34), the fastening portion (37) presenting at least one hole for the mounting of at least one sprocket (15, 16, 17, 18, 19, 20) to the sprocket support member (31,32,33), wherein the fastening portion (37) is axially displaced with respect to the engagement portion (34).
2. The sprocket support member of claim 1, wherein the fastening portion (37) and the engagement portion (34) are arranged in separate axially-spaced planes (37', 34').
3. The sprocket support member of claim 1, wherein the fastening portion (37) has an axial thickness substantially equal to the desired axial distance between multiple sprockets (15, 16, 17, 18, 19, 20) of the sprocket assembly (10).
4. The sprocket support member of claim 1, including an axial projection (44) located between the engagement portion (34) and the fastening portion (37).
5. The sprocket support member of claim 4, wherein the axial projection forms a support against which a radially projecting portion (52) of a fastening element (48) is destined to rest.
6. The sprocket support member of claim 5, wherein the axial projection (44) has a centering and support seat (45) having the shape of a cylindrical sector coaxial

with the fastening hole (42) of the fastening portion (37).

7. The sprocket support member of claim 5, wherein the axial projection (44) is located at the base of a radial contact surface (40) of the fastening portion (37).

8. The sprocket support member of claim 1, wherein the fastening portion (37) and the engagement portion (34) form a single structural unit (37,34), the engagement portion (34) being aligned with the fastening portion (37) in a radial direction.

9. The sprocket support member of claim 8, wherein the structural unit (34, 37) includes at least one weight-saving cavity (39) located between the engagement portion (34) and the fastening portion (37).

10. The sprocket support member of claim 8, including a plurality of structural units (34, 37) angularly equidistant from each other and connected together by zones (38) having reduced dimensions in the radial direction.

11. The sprocket support member of claim 1, wherein the support member (31, 32, 33) is made of a material chosen among the group consisting of: steel, aluminum and its alloys, titanium, and fabric made of structural fibers incorporated in a matrix of plastic material, in which the fibers are chosen among carbon fibers, glass fibers, aramid fibers, boron fibers, ceramic fibers or any combination thereof.

12. A sprocket assembly for a bicycle comprising:
at least one subgroup (28, 29, 30) including a sprocket support member (31, 32, 33) comprising at least one engagement portion (34) provided with means (35) for coupling with a bicycle freewheel and at least one fastening portion (37) arranged in a

radially external position with respect to the engagement portion (34), the fastening portion (37) presenting at least one hole (42) for the mounting of at least one sprocket (15, 16, 17, 18, 19, 20) to the sprocket support member (31, 32, 33), wherein the fastening portion (37) is axially displaced with respect to the engagement portion (34); and

at least two sprockets (15 and 16, 17 and 18, 19 and 20) fixed to the fastening portion (34), wherein at least two of the sprockets (15 and 16, 17 and 18, 19 and 20) are fixed on the same side of the fastening portion (37).

13. The sprocket assembly of claim 12, including a plurality of fastening elements (48) for mounting at least a first and a second sprocket (19, 20) against a contact surface (40) of the sprocket support member (31, 32, 33).

14. The sprocket assembly of claim 13, including at least one spacer means (52) located between the first and second sprockets.

15. The sprocket assembly of claim 14, wherein the spacer means (52) includes two mutually opposite contact surfaces (55, 56) against which respective contact portions of the first and second sprockets (19, 20) rest.

16. The sprocket assembly of claim 15, wherein the contact surfaces of the spacer means (52) are parallel to the contact surface (40) of the fastening portion (37).

17. The sprocket assembly of claim 13, wherein the fastening elements (48) carry the spacer means (52).

18. The sprocket assembly of claim 17, wherein the spacer means (52) is integrated with the fastening elements (48) .

19. The sprocket assembly of claim 18, wherein each of the fastening elements (48) includes an integral shoulder (52) with two opposing contact surfaces (55, 56).

20. The sprocket assembly of claim 12, wherein each of the fastening elements (48) has a first cylindrical portion (51) that engages two aligned coaxial holes (42, 47) of the fastening portion (37) and the first sprocket (20).

21. The sprocket assembly of claim 20, wherein each of the fastening elements (48) has a second cylindrical surface (53) that engages a hole (46) of the second sprocket (19).

22. The sprocket assembly of claim 21, wherein each of the fastening elements (48) includes a radial shoulder (52) between the first and the second cylindrical portion (51, 53).

23. The sprocket assembly of claim 12, wherein each of the fastening elements (48) has a first head (50) with an outer surface substantially flush with an outer surface (41) of the fastening portion.

24. The sprocket assembly of claim 23, wherein each of the fastening elements (48) has a second head (54) with an outer surface substantially flush with an outer surface (58) of the second sprocket (19).

25. The sprocket assembly of claim 12, wherein each of the fastening elements (48) has a radially projecting portion (52) arranged to make contact with an axial projection (44) located in a radially internal position with respect to the fastening portion (37).

26. The sprocket assembly of claim 12 wherein each of the fastening elements (48) is a rivet.

27. A sprocket assembly for a bicycle, including a plurality of subgroups, each of which includes:

a sprocket support member having at least one engagement portion shaped to engage a bicycle freewheel hub and at least one fastening portion arranged in a radially external position with respect to the engagement portion; and

at least two sprockets attached to the fastening portion;

wherein the subgroups can be axially mounted on the bicycle wheel hub in contact with each other.

28. The sprocket assembly of claim 27, wherein the fastening portion of at least one of the subgroups has an axial thickness substantially equal to the desired distance between two adjacent sprockets belonging to two different, mutually adjacent subgroups.

29. The sprocket assembly of claim 28, wherein the fastening portion of at least one of the subgroups has an outer radial surface that rests against an outer radial surface of a sprocket of an adjacent subgroup.

30. The sprocket assembly of claim 27, wherein the at least two sprockets are spaced apart from each other by a distance substantially equal to the axial thickness of the fastening portion.

31. A bicycle sprocket assembly comprising:
a sprocket support member having:

- a planar frame defining a first plane;
- a plurality of fastening tabs fixed to and extending radially-outwardly from the frame and being co-planar with the frame, each tab having a through hole;
- an annular step fixed to and extending axially from the planar frame;
- a plurality of engagement teeth fixed to and extending radially-inwardly from the annular step and defining a second plane axially-spaced from the first plane;

and,

a pair of sprockets mounted on the support member and arranged so that both sprockets are positioned on the same side of the first plane and at least a portion of the first sprocket and a portion of the second sprocket are positioned on opposite sides of the second plane.

32. A bicycle sprocket assembly comprising:

a sprocket support member having:

- a planar frame defining a first plane;
- a plurality of fastening surfaces on the frame, each surface having a through hole;
- an annular step fixed to and extending transverse to the planar frame;
- a plurality of engagement teeth fixed to and extending radially-inwardly from the annular step and defining a second plane axially-spaced from the first plane;

a plurality of fasteners;

a pair of sprockets having radially-inwardly projecting fastening tabs with a through hole, the sprockets being fixed on the same side of the support member by inserting one of the fasteners within aligned through holes in the sprocket fastening tabs and the support member fastening surfaces; and

means for radially supporting each of the fasteners and the fastening tabs of at least one of the sprockets.